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Jean Doerr

University at Buffalo School of Law (Student)

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Government Regulation of Coal Mine Health and Safety

by Jean Doerr

EDITOR'S NOTE: This article was prepared prior to the methane gas explosion in the Dutch Creek No. 1 mine. The explosion emphasizes the importance of the issues of miners' safety presented in Ms. Doerr's article. The editors hope that the death of fifteen miners will stimulate more effective safety measures in the mining industry.

Coal mining is the most hazardous industrial job in the United States. It is more hazardous than mining in most of the major coal producing countries of the world. A coal miner today is seven times more likely to be killed on the job than the average American worker, and American miners are two and a half times more likely to be killed on the job than miners in England. "In the 100 years that partial records of fatal mine accidents have been kept (the early figures are incomplete) more than 120,000 men have died violently in coal mines, an average of 100 every month for a century". (Ben A. Franklin, New York Times reporter, quoted in *Voices from the Mountains*).

The problem of coal mine safety and health is historic. We need no additional studies to delineate the scope or extent of the problem. Unlike other regulated industries where the pervasiveness or sometimes even the essential nature of the hazards involved remain in controversy, the fact of disability and death in our nation's mines defines the issue with a disturbing clarity. There nonetheless remains little or no unity among industry, labor, and government regarding truly effective solutions.

The mining industry may well be the oldest federally regulated industry in the country. Such regulation is marked by three fairly distinct features. First, safety regulation in the coal mines is reactive intervention; in nearly every case involving significant government action, such action has been precipitated by an outcry following a mining disaster of unusual proportion. The most recent example has been the 1968 mine disaster in Farmington, West Virginia. After a methane explosion killed 78 miners, the 1969 Federal Coal Mine Safety and Health Act, which had theretofore been languishing in Congress, was passed and signed within the following month.

The second feature of mine safety and health regulation is again not unique to this particular exercise of government intervention into private industry. The history of mine safety and health regulation and the enforcement of standards is a study in the effective "capture" of the regulatory scheme by the regulated industry. From the earliest days when mine regulation was charged to the pro-production Department of the Interior through the 1969 Act administered at its inception by a pro-management Nixon Administration, advocates of safety and health have perpetually taken a back seat to those who would seek to protect capital first, miners second.

The third characteristic is important in understanding the vicissitudes of coal mine safety and health regulation: Injury and death in the mines is directly related to the

The third characteristic is important in understanding the vicissitudes of coal mine safety and health regulation: Injury and death in the mines is directly related to the erratic production trends prevalent in the industry. Productive mines are not always safe mines and, when industry prospers, the need for restrictive regulation aimed toward the protection of miners' safety is greatest. Although the correlation between erratic production cycles and the rise in the number of accidents and deaths in the mines is one which is readily apparent, it is not a parallel which is frequently drawn. The reasons are obvious. The strength of an industry upon which we are increasingly relying for our domestic energy independence in the 1980's is seemingly incompatible with the articulated goal of Congress in establishing federal mine safety regulation; the need to protect the "most precious resource — the miner". (Federal Coal Mine Safety and Health Act of 1977, 30 USC § 2). Industry most often acknowledges (albeit inadvertently) the correlation between production and accidents by showing figures which indicate a precipitous drop in coal production following passage of the Federal Coal Mine Safety and Health Act of 1969. Production admittedly dropped but so did the number of fatal accidents following the passage of the act. A safe mine they would seem to argue is indeed not a productive mine. It then follows that it is impossible to produce coal at a rate which will meet industrial and national energy needs, insure generous profit margins and at the same time protect the lives of miners. This perceived conflict too often produces compromises in the enforcement of established regulations; compromises which leave miners with far fewer protections than those envisioned by mine safety advocates.

The regulatory status quo in the area of mine health and safety is some improvement over past solutions. Nonetheless, mine disasters continue to occur and will occur with a frequency that will certainly parallel any increase in coal production, provided the current patterns of production are left unregulated. The somewhat gloomy prediction is not a concession to those who would assert that there is an "inherent danger" in the production of coal but rather an understanding that safety and health cost money and profits will, under the present approach, always be protected first.

The Problem: In November of 1968 a methane gas explosion ripped through the number 9 mine of the Consolidation Coal Company near Farmington, West Virginia, killing 78 miners. Standing among the families and friends of those miners who were killed, waiting for word of possible survivors, Tony Boyle, then president of the United Mine Workers of America, said, "As long as we mine coal there is always this inherent danger."

"Every mine disaster in America is followed by an appeal to fate by the mourning coal companies . . . after a faulty dam broke over Buffalo Creek (W. Va.) . . . washing away an entire valley and over a hundred people, a spokes-

men for the Pittston Company which built the dam called it 'an act of God' . . . similar religious dramas are played out for more than 200 dead miners each year." (J. Davitt McAteer *You Can't Buy Safety at the Company Store*, The Washington Monthly, Nov. 1972)

Mine accidents are not acts of gods. They are caused by poorly maintained equipment, disregard for safety measures and inadequate miner training. The vast majority of accidents are clearly the fault of coal companies; companies whose production practices are inconsistent with the necessary care required to insure a safe and healthy working mine.

A coal miner today is seven times more likely to be killed on the job than the average American worker. . . .

An analysis of coal mining accidents compiled by the staff of the Division of Mining Information Systems Health and Safety Analysis Center contains a classification scheme which categorizes all reported mine accidents according to 21 identifiable accident circumstances or accident types. In 1978, deaths resulted most often from roof falls. Powered haulage equipment was responsible for the second greatest number of deaths, followed by electrical accidents and falls of the face, rib, pillar, side or high-wall. Methane explosions are not the most common cause of death in mines, they simply kill with a drama which more than adequately illustrates the danger of coal mining. And mine accidents are not always confined to the working area. An accident, classified by the Mine Information Systems Health and Safety Analysis Center, as being caused by "an unstable condition or failure of an impoundment, refuse pile or culm bank requiring emergency preventive action or evacuation of an area" occurred in 1972. In an article which appeared in the Washington Monthly in May of 1972, Tom Bethell and J. Davitt McAteer described such an accident as follows:

"When coal comes out of the earth there is refuse, rock and other material. It is sorted out before the coal is loaded into railroad cars and trucked away to be dumped wherever convenient. The dump — called a 'gob pile' or 'slag heap' grows steadily. Over a time it may stretch hundreds of yards across an entire valley, growing hundreds of feet high as the dumping continues."

A gob pile stretching across a valley is an obvious solution to the problem of how best to store and re-use the vast quantities of water required by coal preparation operations. Operators in Buffalo Creek, West Virginia, reasoned that since the pile of coal waste refuse looked like a dam it could in fact be used as a dam. Unfortunately gob piles, although waste, are composed of flammable wastes. A fire which starts deep within a gob pile will smolder, burn slowly and occasionally explode. On February 26, 1972, the gob pile dam used by the Pittston

Coal Company did explode, sending "21 million cubic feet of water and an immeasurable mass of mud and rock and coal wastes . . . charging through the narrow valley of Buffalo Creek." In the end, 16 communities were destroyed and 125 people were killed.

The keys to improved mine safety are properly maintained machinery, an insistence upon adherence to prescribed and improved mining plans, required compliance with at least minimum safety standards, a modicum of training for new miners, retraining for experienced miners who switch to new jobs and maintenance of production at a moderate and steady pace. The promulgation of equipment standards or the establishment of miner training requirements, however, are not by themselves sufficient solutions. It is becoming increasingly imperative to look at the effect of erratic production cycles on conditions in the mines and note that in the absence of production controls all the safety regulation possible will produce little significant improvement.

Production Patterns: Throughout its history, the coal industry has been distinguished by pronounced and erratic production and employment cycles. "Between 1948 and 1968, average coal prices fluctuated within the narrow band of \$4.39 to \$5.08 per ton." (Collective Bargaining, Contemporary American Experience, I.R.R.A. 1980). Railroads and our nation's cities grew and prospered as the result of this "cheap coal". With the introduction of alternative fuels such as oil and natural gas, reliance on coal declined. Productivity dropped and unemployment soared. By the 1970's coal was no longer cheap.

While coal was cheap, working conditions in the mines were hazardous. Aggressive competition among a large number of producers created a climate for the rapid urbanization of America. The ruthless fight for a share of the market, however, guaranteed minimum expenditures on health and safety.

The prevailing conditions in the industry today are much different from those which existed in the years before the dramatic changes which led to modernization of the mines. Coal production is highly centralized and unlike decades ago when the industry was characterized by competition among a vast number of producers only a few large companies today share a substantial percentage of the total coal production in our country. Nonetheless, erratic production cycles survive. Coal mining is still very much a boom or bust industry. And with each precipitous rise in production comes the inevitable and predictable rise in injury and death. In 1975, for example, the "production of 640 million tons was the largest since 1947. At that production level 152 American miners died — twenty more than in 1974. And during the first 10 months of 1975 nearly 9,000 miners suffered injuries, a total up 1,600 from the year before." (*The Coal Boom: Safety and Tonnage*, The Nation, March 1976)

Production increases do not simply or solely follow increased market demand. A production increase over the short run, or stock-piling, is a common industry tactic in the arena of labor relations. Coal producers, as a matter of course, prepare for UMWA contract negotiations months

before the expiration of the prior contract; in anticipation of a strike, companies will dramatically increase production in an effort to create reserves which, in turn, will enable operators to wait out a strike without the attendant loss of profits. The result of stockpile building is that striking miners will usually reach the breaking point well before the companies do. In December of 1977, when the Mine Workers went out on strike after contract negotiations failed, there was a reported 100 million tons of coal on the ground (stockpiled). Reserves of that size enabled operators to wait out a strike lasting 111 days. In the early part of 1981, in anticipation of contract renewal difficulties, operators had amassed a reported 200 million tons of coal on the ground, over an estimated four-month period of time. The duration of the current strike remains to be seen. It is nonetheless apparent that the practice of stockpiling has all but rendered the union's single most effective weapon useless.

When the companies push production over the short run, safety inevitably suffers. A stable and safe mining environment depends in large part upon steady and predictable work practices. When production goals are emphasized, miners are directed to work longer, faster or on jobs for which they are undertrained or unqualified. Production peaks may necessitate the hiring of new, undertrained and inexperienced workers. When increased production goals are set, it becomes more likely that corners will be cut on the maintenance of equipment; less time is spent on rock dusting and clean-up before and after shifts. Supplies fall short and roof bolters are required to use shorter bolts or inadequate timbers. When the focus is on production, time may not be set aside to adequately test methane gas levels or perform other, simple and yet time consuming safety tasks. Pre-shift examinations of the working face may be perfunctory or ignored altogether and pre-work shift meetings may be discouraged or dispensed with because of the time involved.

Erratic production patterns are the rule and not the exception. Erratic production trends create a climate for increased accidents and they do, in fact, result in an increased number of injuries and fatalities.

Existing Solutions: Mine accidents and disasters are avoidable and improved safety is well within operators' control. The solutions to date have taken two basic forms — government intervention in the form of regulatory legislation and union representation with attendant collective bargaining protections. Both, in many cases, mirror one another or overlap. They are dealt with individually, however, because the approaches represent divergent underlying premises regarding the problem of safety in the coal mines. The government's position, it is suggested, is rooted in a basic pro-production concern, with the apparent result that little connection has ever been drawn between production patterns and accidents. Government intervention into the coal industry began first under the auspices of the production oriented Bureau of Mines and was later transferred to the Department of the Interior. It remained there until 1977 when the Federal Coal Mine Health and Safety Act of 1977 transferred enforcement from the Department of Interior's Mine Enforcement Safety Administration

(MESA) to the Mine Safety and Health Administration (MSHA) in the Department of Labor.

Though administration and enforcement of mine safety regulations is now charged to a comparatively pro-worker agency, it is nonetheless the Mine Safety and Health Administration's position that there is no correlation between erratic production cycles and increased accidents and fatalities. "A safe mine" officials assert, "can be a productive mine". While admitting that such a position is central to their ability to sell the need for additional regulation or improved enforcement to Congress and big operators, (those opposed to federal mine safety regulation argue that such controls depress production), such obvious constraint is not considered to be a significant influence in their overall strategy.

The United Mine Workers of America, by contrast, made the productive-injury connection relatively early. John L. Lewis, throughout his tenure as president of the UMW, recognized the adverse effect of sporadic overproduction and would in fact frequently direct work slowdowns or stoppages to stabilize coal production throughout the industry. In 1949, for example, when "industry was facing its chronic problem of overproduction", Lewis called for a one-week stabilizing work stoppage. "This period of inaction" he said, "will emphasize a lack of general stability in the industry and the dangers which will accrue therefrom if current harmful practices are not remedied." (Miernyk, *Coal, Collective Bargaining: Contemporary American Experience*)

Regulation: Federal regulation of the coal industry is "reactive"; significant government intervention has generally been preceded by, indeed precipitated by, public outcry following mining disasters of unusual proportion.



The legislation of 1910, which created the Bureau of Mines some forty years after its initial proposal, was won at the cost of thousands of miners' lives. In 1907 there occurred two of the most awesome mining disasters in our nation's history. In that year, a methane explosion killed 358 miners in Monogah, West Virginia. The casualty list, however, included only those officially recognized as employees of the coal company. "In the early years of the century . . . a miner was paid for all the tonnage produced in his section". He would therefore hire assistants who worked for him. Company payrolls, as a result, accounted for "a fraction of men working in the mines. Unofficial counts of those killed at Monogah number between 620 and 956." (NYDEN, *Miners for Democracy: Struggle in the Coal Field* 1975) A second explosion that year took 236 lives in a mine in Jacobs Creek, Pennsylvania. Again 236 was only the official count.

When the Bureau of Mines was first created, it was charged with providing government assistance to the states and to operators in coal mining research aimed at increasing production through improved mining techniques. A secondary focus of the Bureau was the reduction or prevention of accidents. The legislation which created the Bureau however, "was not only devoid of any enforcement authority but it expressly denied Bureau employees any authority to inspect or supervise a mine or any phase of mine related operations." (McCulloch, *West Va. L. Rev. Symposium on Federal Coal Mine Health and*

Safety Regulations 1977) It was perhaps one of the most benign forms of government intervention imaginable.

The next piece of federal regulatory legislation was Public Law 77-49, passed in 1941 after three separate methane explosions killed 199 miners. The 1941 Act gave Bureau employees authority to make inspections in conjunction with state conducted investigations or enforcement actions, and to publicize their findings. Regulation of mining conditions still, however, lay solely with state agencies. The 1941 legislation did not allow for independent federal action and was not a grant of regulatory power. It was legislation designed simply to supplement the work of state agencies.

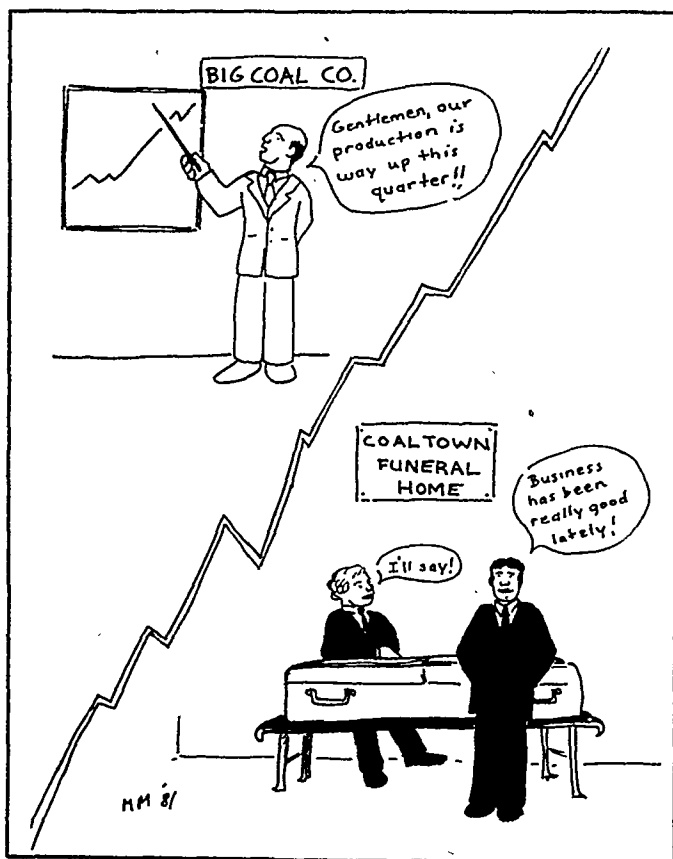
In 1946 the first mine safety code for bituminous coal and lignite mines was passed. The Bureau of Mines, however, still had no enforcement power. The code presumably was intended only as a tool in seeking voluntary compliance from operators.

In 1951, 119 miners died in an explosion at the Orient Mine in West Frankfort, Illinois. Not surprisingly, in 1952 Congress passed the second major piece of mining legislation. It constituted the first major step toward the establishment of effective federal regulation. The 1952 Federal Coal Mine Health and Safety Act, 66 Stat. 692, gave federal inspectors authority to enter mines without the owners' consent, to write notices of violation, and to issue closure orders when ultra-hazardous conditions presenting an imminent danger were found to exist. The law, in spite of the advances it represented over previously enacted legislation, was still fairly weak. Its application was restricted only to those mines employing more than fifteen underground workers and its orientation was primarily toward highly dangerous conditions which created the risk of a major disaster and not toward those an inspector might reasonably believe posed a lesser danger. In addition, as a practical matter, the Bureau rarely issued a closure order for failure to abate, and if the operator was making any effort at all to abate he was usually immune from closure orders. And again, as was the case with the 1941 legislation, most regulatory enforcement authority still lay with state agencies.

In 1966, the 1952 Act was amended by Public Law 89-376 to include smaller mining operations and to give inspectors authority to issue closure orders for repeated violations or what was later categorized as "unwarrantable failure" to abate a dangerous condition.

The next major piece of federal coal mine safety legislation was passed by Congress in 1969. The 1969 Act was passed in response to a vociferous public outcry following the mine explosion in Farmington, West Virginia, in which 78 miners lost their lives. Out of the rubble of the Farmington disaster, grew a grassroots effort to marshal improved miner health and safety legislation through Congress and across the President's desk. The Federal Coal Mine Safety and Health Act of 1969 was passed by Congress and sent to the President in late December of 1968, a month after the Farmington disaster. There was every reason to believe that President Nixon would veto the bill particularly after administration-led attempts on the floor to send the bill back to committee failed. On December 30, however, seven widows of Farmington miners went to the White House and confronted Nixon,

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Coal Mine Safety . . .

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who, after carefully explaining the bill's potential adverse impact on production, signed it without ceremony and with no attendant publicity. He had, it appeared, failed the coal operators in a significant way. He would nonetheless make it up to them in small measures throughout the remainder of his presidency.

Nixon's threatened veto of the 1969 Federal Coal Mine Health and Safety Act was a clear indication of the esteem in which he held Congressional efforts to put into place the first occupational safety law ever passed. After the bill was signed, Nixon fired the Director of the Bureau of Mines who would have been the person charged with enforcing the new law. His reputation for a commitment to safety had sealed his fate. Six months later (a six month hiatus in the implementation of the Act), Nixon appointed an engineer "with little or no interest in health and safety . . . (who) publicly assured the industry that he did not think various sections of the tough new law called for vigorous enforcement." (J. Davitt McAteer, *Coal: Still a Disaster Area*, The Nation 1977)

Between December of 1969 and December of 1972, four major disasters killed a total of 177 persons. In response to pressures which followed, responsibility for enforcing the 1969 Act was transferred from the Bureau of Mines to the Department of the Interior where the Mining Enforcement and Safety Administration was formed. "The Interior Department and Mine Safety were popular resting places for . . . Nixon campaign supporters." (*Coal: Still a Disaster Area*, The Nation 1977). Cronyism appeared to be the qualifying criteria for positions with the new agency and once again Nixon had, through his appointments, assured the industry of his continued commitment to lax enforcement. In the public hearings held prior to the creation of MESA, Senator Harrison Williams of New Jersey, relying upon a 1971 GAO report to the Senate Subcommittee on Labor, stated that "The Comptroller General found delays in the processing of cases, reductions of 20% in the amounts of assessments through an unrecorded amendment process, no guidelines for assessment officers to follow in assessing penalties, numerous instances of penalties at the lowest

rate for some of the nation's largest coal mine operations and an understaffing of the penalty assessment office despite availability of funds as appropriated by Congress." Little changed in 1973. Under MESA's control, "fines assessed . . . would not have financed a week's wash. They amounted to less than 3¢ per ton of coal mined. In fact, the program was so carelessly designed and administered that a Federal court struck down even these small fines as being arbitrary and capricious". (*Coal: Still a Disaster Area*, The Nation 1977). The 1969 Act was clearly sabotaged. The law provided too much room for the exercise of discretion at all levels of the enforcement bureaucracy. Perhaps it was naive for health and safety advocates to assume that an effective law would be effectively enforced.

In the Spring of 1977, hearings were held in the Senate before the Committee on Human Resources, Subcommittee on Labor, to assess MESA's performance under the 1969 Act; it was described generally as poor. The more restrained witnesses who testified recounted little improved injury and fatality figures, while more angry witnesses described MESA's enforcement performance as "meaningless". In general, it was concluded that prior mine safety and health legislation (particularly the 1969 legislation) suffered from cumbersome rule-making procedures, inadequate enforcement mechanisms with which to deal with chronic violators and poor civil penalty assessment.

In the wake of this criticism, Congress passed the Federal Mine Safety and Health Act of 1977. The major provisions of the 1977 Act include: 1) new procedures designed to expedite the rulemaking process, 2) increased protections and rights extended to individual miners, 3) transfer of the enforcement responsibilities from the Department of the Interior (MESA) to the Department of Labor (MSHA — Mine Safety and Health Administration), and 4) mandatory training for all mine workers. In addition, the Act included provisions for much improved assessment procedures, strengthened enforcement mechanisms and placed greater emphasis on miners' health. In all other respects, the law is identical to the

1969 Act, the 1977 legislation being simply amendments to the then existing regulatory scheme. What had promised to be one of the more effective changes in the law was the shift of mine safety enforcement from Interior to Labor. The attitudinal changes anticipated were thought to be decisive in any realized improvement in miner safety. The UMWA, in an April 1978 assessment of the 1977 Act expressed a hope that DOL's involvement would "inject a new sense of mission into mine safety and health matters." Under the Reagan administration, however, coal mine safety and health regulation will no doubt suffer the same fate as other management opposed occupational safety and health programs.

There is little written to date, regarding enforcement performance under the 1977 Federal Coal Mine Safety and Health Act, and any assessment would of necessity have to be viewed in the light of two significant factors which will predictably impact negatively on the Act's effectiveness. The first factor to be considered is the priority granted to occupational safety and health by the Reagan administration. Without much elaboration it is sufficient to say that the members of the current administration have long considered safety regulation to be a wholly impermissible government intrusion into the realm of management prerogatives. The second negative factor is the move of "captive" coal operations into the competitive coal market. A captive mine is a mine owned and operated by a coal consumer. Captive coal producers/consumers are steel makers, chemical companies and electric utilities. Until recently the captive mines have produced only enough coal to meet their own needs. As a result, production has been steady and predictable. The important factor is that captive coal production has been relatively immune from the erratic and dangerous production patterns that prevail in the competitive coal market. In addition, and by contrast to operators for whom the production of coal is their major concern and source of income, captive operators (steelmakers for example) have experience with industrial safety in an independent context. Safety training in captive operations therefore tends to be better, more thorough and comparatively free from the institutional "inherent danger" bias which colors any attempted mine health and safety efforts. The combined effect of these factors: i.e., immunity from erratic production patterns and independent safety training experience, is that captive operations have had comparatively good safety records. Poor economic conditions in recent years, however have convinced captive operators that there is more profit to be made in the competitive market. With steel production down, for example, the coal reserves owned by steelmakers are an untapped source of capital. The introduction of captive operators into the competitive market will no doubt result in an overall increase in mine accidents and fatalities.

The Role of the UMWA: The United Mine Workers of America has had a major impact on health and safety legislation. The UMWA position on the issue of miners' safety is today, uncompromising — "Coal will be mined safely or not at all." That certainty and direction, however, has not always prevailed.

From the early 20's to 1961 while John L. Lewis was president of the UMWA, attention was focused on efforts to stabilize the industry. Lewis recognized that prevailing production patterns were erratic and ultimately dangerous. While in the past Lewis used work stoppages or slow downs in an effort to stabilize production, long term remedies became increasingly imperative as mine technology began to change.

From the mid-1940's into the 1950's operators were belatedly heralding the arrival of the 20th century and Lewis was there to make sure it arrived on his terms. Recognizing that large scale mechanization would eliminate a vast number of jobs, Lewis negotiated an agreement, through the secretary of the Interior, Julius Krug, which provided for the establishment of a welfare and retirement fund to compensate displaced miners. Although, throughout this period, questions of health and safety appeared to take a back seat to employment and production stabilization, the latter issues were necessarily preliminary problems which had to be solved first. To assert rights which are essentially individual rights; i.e. safe and healthy working conditions, the union had to do so from a position of strength. Lewis' legacy was to bring that strength to the bargaining table and to institutionalize the role of the UMWA in setting conditions under which coal would be mined in this country.

The 1978 National Bituminous Coal Wage Agreement was ratified by a striking membership after a work stoppage which lasted 111 days. Labor did not, in total, do very well. With regard to health and safety however, there are several major portions of the contract which address the problem and which form a strong and clear position seemingly free from assault in any future negotiations. The 1978 contract safety provisions represent a clear recognition of the importance of protecting individual safety rights (an approach only lately embraced by government regulators). The agreement further reflects a realization that contractual solutions, to be effective, must be explicit and well defined. To the extent that responsibilities are clearly delineated, the opportunity to administratively circumvent the intent of the protections offered is greatly diminished. The 1978 contract also reflects an understanding of the importance of training as a solution to the problem of mine safety. The safety and health provisions negotiated in the 1978 agreement take very much the same form as those contained in the 1974 National Bituminous Coal Wage Agreement. (It is unknown at this time whether a 1981 agreement will keep the safety features of the 1978 and 1974 agreements intact). The negotiated provisions also mirror amendments to the 1969 Act made effective in the 1977 legislation. The overall effect is that federal law and regulations extend, in many respects, essential UMWA contract rights to non-union miners. The law thus can only aid union miners to the extent that it is enforced more stringently or administered more effectively than the contract itself.

Alternative Solutions: The coal industry has been the focus of federal regulation since its very earliest days. This concession to a regulatory solution to unsafe mining conditions may, however, simply be the result of inertia and not the product of a well reasoned assessment of possible approaches.

A comparison of coal mines in this country with European mining operations reveals that U.S. mines are easily the most productive in the world. "American coal industry publicists are fond of pointing out that the American coal mine produces more than twice as much coal per shift as his British counterpart, more than five times as much as a West German and nearly 10 times as much as the average Russian miner". (*Overkill: A Report on Mine Safety and Health*, Coal Patrol, 1972). What the publications fail to mention however, is that the rate of U.S. coal production also kills miners, and kills them with an alarming frequency.

Geological surveys reveal that U.S. mines are typically only a few hundred feet deep; "Coal is removed from a seam running horizontally, generally without much dipping or pitching, and the seam is normally between three and six feet deep". (Coal Patrol, 1972). Compared to most European mines, those are ideal conditions. "European coal seams are two to four thousand feet down. The seams are often less than three feet thick. Roof conditions - - under the massive weight of thousands of feet of overburden - - can be extremely hazardous. The seams often dip and pitch posing severe maneuvering problems for machinery. And making matters still worse, European coal seams are heavily saturated with methane". (Coal Patrol, 1972) In spite of such conditions, European coal operations are safer than U.S. mines. Clearly the industry, by virtue of adverse geological factors, has been forced to tailor their mining practices to prevailing conditions. The result is the development of sophisticated technology far in advance of U.S. coal mining technology. By comparison with European mining operations the room-and-pillar method of extracting coal used in this country seems hopelessly archaic and dangerous. The European developments are newer and markedly safer, indicating that a possible solution to unsafe mining conditions in this country may be in the area of improved technology.

There are four major mining methods now used in European mines which, if adopted in this country, would have a marked impact on mining conditions: longwall mining, explosion barriers, water infusion, and methane drainage.

Described briefly, "longwall mining is a method whereby coal is removed by a cutting machine traveling from one end of the coal face to the other . . . mined coal drops onto a conveyor belt running the length of the coal face, parallel to the cutting machine and is carried to the haulage way for transport to the surface . . . Protecting men and machinery is a row of hydraulically operated steel roof supports — gigantic jacks in effect - which move forward with the cutting machine. The whole operation advances in a continuous line". (Coal Patrol, 1972).

Longwall mining is safer because the roof supports provide effective overhead protection, thus preventing roof falls which continue to be the single major cause of fatal accidents in mines in this country. In addition, with the

longwall method it is easier to ventilate a mining area and it is easier to reduce the levels of dust in the air. In spite of its advantages, longwall mining accounts for only a small percentage of U.S. coal production. One of the problems is that longwall mining requires an enormous initial capital investment. Only those larger producers with sufficient reserves against which to balance the necessary conversion costs could possibly afford the change from room-and-pillar methods to longwall mining. In the absence of a long term production commitment from a consumer, domestic or otherwise, it is unlikely that many producers will adopt this method, at least in the very near future.

By comparison with European mining operations . . . methods . . . used in this country seem hopelessly archaic and dangerous.

While roof falls are the most prominent cause of death in the mines, the disasters with which we are all familiar are caused by the explosion of methane gas. European mines are far more gassy than American mines and again European operators have thus been forced to develop methods which effectively deal with this problem. The result is adoption of methane control methods far in advance of any used in this country. In Soviet mines, for example, methane sensors line the longwall face. When dangerous levels of methane are detected all electrical equipment in the area is automatically shut off. Fans are then used to draw the methane out of the mine. Such "outgassing" is performed regularly both before and during shifts and in some countries the methane recovered is used for fuel. U.S. mines, by contrast, must rely upon "the flicker of a safety lamp or the hand operated methane monitor (as) the only way to guess the level of methane gas". (J. Davitt McAteer *You Can't Buy Safety at the Company Store*, The Washington Monthly, Nov. 1972). Compared to the sophisticated sensors found in European mines, such protections are little better than detection methods used at the turn of the century. In those days, canaries were released near the mine face prior to a shift and, presumably, if the canary survived, the area was safe for workers.

The connection between pervasive levels of coal dust and Black Lung is well known. Few realize, however, that "Fine particles of coal dust hanging in suspension are almost as volatile as methane, and when methane explodes the dust nearby can spread the blast and turn a local fire into a general holocaust." In American mines, coal dust is kept down with rock dust; powdered limestone spread on the walls and floors of a working mine area. In European mines it is recognized that rock dusting is not enough. To supplement rock dusting, operators use explosion barriers or platforms which hang

from the ceiling and which fall, after the shock of an explosion, dropping dust and/or water at various points along the fire's expected path.

Hundreds of miners die each year from Black Lung and each year hundreds more are compensated under the Black Lung Benefits Program. It is significant that the U.S. response to pneumoconiosis is a compensatory approach, with little additional energy expended on the development or implementation of preventive measures. In European mines, dust suppression is an art. Among the methods employed, the most effective is a water infusion method which involves pumping water into the coal seam before mining. Such a technique is used in only a fraction of U.S. mines, despite its relatively low costs.

The fact that these and other improved mining methods are not in place in U.S. mines, primarily because of the presumed, or even real, adverse impact on profits is deplorable. All the methods described have proven to be effective in either mitigating or altogether eliminating unsafe mining conditions and all are economically burdensome and thus rejected with impunity.

The Rushton Experiment: In 1973, UMW members and company officials at Rushton Mining Company's mine in Pennsylvania agreed to an experiment in mine safety based on similar experiments conducted in the British Coal Mines. The Rushton experiment described in the November 1976 issue of *The United Mine Workers Journal*, involved an approach which suggested that a focus on day-to-day operations and working relationships are in fact the keys to improved mining conditions. The major features of the program, briefly stated, were:

- 1) The company agreed to suspend its right to direct the workforce under the UMW contract.
- 2) Each crew was to direct its own work, with the foreman having responsibility only for safety.
- 3) Training in job skills and safety requirements was greatly expanded with the goal of teaching every crew member how to do every job.
- 4) Accordingly, each crew member was paid top rate.
- 5) Grievances were settled, if possible, by a joint committee of elected representatives of each crew on the section, local union leaders and management.
- 6) At all times, both sides retained the right to settle any unresolved disputes through the regular contract grievance procedures, or to drop the program entirely.
- 7) The company and the miners were to share in any increased profits which resulted from the new work arrangement.

The program was in force for three years and was rooted primarily in a theory which emphasized the importance of miner control of working conditions. To that extent, the experiment was considered radical. It depended entirely upon a willing relinquishment of managerial oversight. Such a relinquishment was both the key to the program's

success and the source of its demise. In the end, controversy over the necessary degree of worker control sufficient to accomplish the program's goals became insurmountable. The result was that major portions of the experiment were abandoned and only those portions which peripherally infringed on traditional managerial prerogatives were allowed to continue. However, for the period in which the program operated intact, it was highly successful, suggesting that improved health and safety in the coal mines may depend upon an entirely new approach to the employment relationship.

A chronic and historic emphasis on production at the cost of safety has long been characteristic of the coal industry. Safety and health are clearly, in the end, economic issues. As long as safety costs more than production losses resulting from accidents or disasters or as long as safety costs more than penalties assessed under the law, we can expect little improvement in mining conditions in this country. Clearly, more effective enforcement of existing government regulations is preferred to a pure market solution which suggests that the profit motive is sufficient impetus to compel owners to improve working conditions. Reliance on management to maintain a safe and healthy workplace, in the absence of any effective compulsion to do so, is misplaced at best and, in fact, foolish. Government regulation of mining conditions is, however, by itself, not sufficient.

A safe mine may well be a productive mine but only if production patterns necessary to produce reasonable profits are kept stable. It is the nature of the process that coal production, at any one single working face, has an identifiable limit. Each mine, given current technology, has a defined production capacity. Machines can only work so fast and miners can only work so long. There is a point at which a production emphasis, in disregard of those inherent technological and human limits, can only result in injury and death. The ultimate solution, therefore, is not to cut back on or eliminate government regulation but, in addition to maintaining the current regulatory status quo (with some improvement in enforcement), to refocus government oversight toward a concern for production. The focus of government intervention would be on rational production not simply production aimed at a maximization of output and profits. It may well be that rational production effectively imposed (with effectiveness measured by the impact on mining conditions and not on rates of return on capital investment) will have a tendency to depress profits. In the calculus that seeks to find a trade-off, however, among, 1) mine safety, 2) production sufficient to meet 1981 energy needs, and 3) maintenance of excess profits; the third component is the most expendable.